DYNAMIC SAUNA

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is a continuation of U.S. patent application Ser. No. 16/538,117 filed Aug. 12, 2019, which is a continuation of U.S. patent application Ser. No. 15/654,180, filed Jul. 7, 2019, now U.S. Pat. No. 10,376,442 issued Aug. 13, 2019, which is a division of U.S. patent application Ser. No. 14/217,208, filed Mar. 14, 2014, now U.S. Pat. No. 9,744,098 issued Aug. 29, 2017, which is a continuation of U.S. U.S. patent application Ser. No. 12/426,762, filed Apr. 20, 2009, now U.S. Pat. No. 8,676,044 issued Mar. 18, 2014, which is a continuation of U.S. Pat. No. 12/205,597 filed on Sep. 5, 2008, now abandoned, which is a continuation-in-part of U.S. patent application Ser. No. 12/051,521, filed Mar. 19, 2008, now U.S. Pat. No. 8,588,593 issued Nov. 19, 2013, the disclosures of each of which are incorporated herein, by reference, in their entirety.

SUMMARY

[0002] Exemplary embodiments are defined by the claims below, not this summary. A high-level overview of various aspects thereof is provided here to introduce a selection of concepts that are further described in the Detailed-Description section below. This summary is not intended to identify key features or essential features of the claimed subject matter, nor is it intended to be used in isolation to determine the scope of the claimed subject matter. In brief, this disclosure describes methods and systems for independently controlling the temperature of heat sources such as heat sources in a sauna. More particularly, exemplary embodiments permit independent control of infrared radiation (IR) emitters within a sauna, including tuning peak IR frequency emission ranges and radiated power levels of IR emitters and targeting those emitters at desired locations on a user's body. For example, various IR emitters may be located within a sauna such that the IR emitters are each pointed at a particular part(s) of a user's body in normal use, thereby permitting the selective warming or treatment of particular portions of a user's body.

[0003] IR emitters in accordance with exemplary embodiments permit a user to select one or more temperatures (or peak-infrared wavelength), with different temperatures/peak wavelengths being selectable for different heating elements. In accordance with exemplary embodiments, multiple heating elements (potentially emitting at different, selected peak wavelengths) may be combined into a single compact area. Further, IR heating elements in accordance with exemplary embodiments may generate and withstand temperatures associated with traditional saunas, at which air convection currents form. Accordingly, heating elements in accordance with exemplary embodiments may be used to produce both IR sauna experiences and traditional sauna experiences, whereas previously a given sauna heating element was either a traditional heating element (such as a hot rock or steam, for example) or an IR heating element.

[0004] In one embodiment, a sauna including a plurality of IR emitters operable to emit IR over specified wavelength-ranges, at least one driver module for operating the emitters, and a heat control module for facilitating control of the infrared emitters is described. For example, at least one IR emitter may comprise one or more heating elements which may include arrays of light emitting diodes (LEDs) capable of emitting IR. An additional example may comprise one or more arrays of LEDs and one or more non-LED heating elements. A non-LED heating element may comprise, for example, a high resistance polyamide panel, a ceramic heater, a carbon black based heater, or any other type of infrared emitting heating element, some of which are described further herein. In this fashion, one or more peak IR wavelengths may be selected. Further, the absolute and/or relative power of one or more IR peaks may be selected. The wavelength and/or power of an IR peak may also be varied over time or distance by the driver. Such variance may be based upon user settings and/or selections or may be predetermined.

[0005] In another embodiment, a method is provided for using a sauna including receiving information related to wavelength-ranges of IR, conveying at least a portion of this information to one or more driver modules, and emitting IR from one or more emitters that are coupled to the one or more driver modules. The method further includes emitting IR having a wavelength-range that corresponds to the received information relating to one or more wavelength ranges of IR. In one illustrative embodiment, IR of a first wavelength-range is radiated from a first emitter and directed to a first location on a user's body, and IR of a second wavelength-range, different than the first wavelength range is radiated from a second emitter and directed to a second location on the user's body. Accordingly, a sauna user may select the wavelength of IR received during sauna use and may even further select different IR wavelengths for different body portions and/or times.

[0006] In another embodiment, a method is provided for tuning IR heating in a sauna. The method includes receiving information related to one or more IR wavelength-ranges; receiving corresponding information related to IR radiated output power-levels; and emitting, from one or more IR emitters or heating elements, IR having wavelength-ranges and power-levels that correspond to the received information. In one embodiment, the information related to one or more IR wavelength-ranges and corresponding information related to IR radiated output power-levels may be provided by a user. In another embodiment, this information may be provided by a computing device.

[0007] Another exemplary embodiment includes infrared heaters with adjustable outputs. For example, IR LEDs and non-LED IR heating elements such as a high resistance polyimide film, a ceramic heater, a carbon black based heater, or any other type of infrared emitting element, some of which are described further herein, may be used in various combinations. In this way, a desired peak IR wavelength(s) may be obtained for use in a variety of heating applications.

[0008] Exemplary embodiments also include an IR heater that may have two or more portions designed to operate at different temperatures and produce multiple peak IR wavelengths. For example, a high resistance polyimide film may have two or more portions that operate at different temperatures, thereby outputting different peak IR wavelengths. In this example, the two or more portions of a high resistance polyimide film may be fixedly or adjustably set to operate at their respective temperatures.

[0009] In another embodiment the peak wavelength and power output of an infrared heater, can be independently controlled. Instead of controlling both output power and